

REMARKS

The following remarks are responsive to the Office Action of June 1, 2005.

Claims 1-12 are pending as a result of this amendment. Claims 1-4 and 8-9 were rejected under 35 U.S.C. § 103(a) as obvious over Bevan et al. (U.S. Patent No. 6,891,897). Claims 5 and 10 were rejected under 35 U.S.C. § 103(a) as obvious over Bevan et al. in view of admitted prior art on pages 5-6 of the specification. Claims 2-4 and 6-7 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Claims 11 and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form. The Applicants appreciate the indication that claims 11 and 12 are allowable.

Concerning the rejections under 35 U.S.C. § 112, second paragraph, claim 1 and claim 5 have been amended to use the more conventional transitional phrase “comprises” instead of “consists.” Thus, such an amendment addresses the inconsistency noted in the Office Action between independent claim 1 and claims 2-4 that depend therefrom, and independent claim 5 and claims 6-7 that depend therefrom. In addition, Applicants have made several additional, minor grammatical and form amendments to the claims which puts them in better form for allowance. Accordingly, it is respectfully requested that the rejections under 35 U.S.C. § 112, second paragraph, be withdrawn.

Claims 1-4 and 8-9 stand rejected under 35 U.S.C. § 103(a) over Bevan et al. In addition, claims 5 and 10 stand rejected under 35 U.S.C. § 103(a) over Bevan et al. in view of applicants’ admitted prior art (AAPA) on pages 5-6 of the disclosure.

The Office Action fails to establish a *prima facie* case of obviousness. In particular, the obviousness rejections do not meet the standards set forth in MPEP 2143.01 for combining prior art references. As one example, the Office Action states that “it would have been obvious for one of ordinary skill in the art at the time of the invention that the transmitter in figure 9 [of Bevan] can be modified to employ a block interleaver instead. For block interleaving, data stream is subdivided into successive blocks as appreciated by one of ordinary skill in the art.” (Office Action, Page 4) In essence, the Office Action merely identifies a claim element that is absent from Bevan, and then conveniently concludes – without any support from the prior art – that it would have been obvious to modify Bevan in

the manner recited by the claims. As clearly warned against in the MPEP, “The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggested the desirability of the combination.” MPEP 2143.01, citing *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Applicants further point out that the MPEP also warns that “A statement that modification of the prior art to meet the claimed invention would have been ‘well within the ordinary skill of the art’ at the time the claimed invention was made’ because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references.” MPEP 2143.01, citing *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). Moreover, in the present situation, not only is the obviousness rejection not supported by a reason to combine the references, but the feature of the claims that is missing from Bevan – a block interleaver – is not found in any prior art references. Instead, the Office Action merely concludes that such a modification would have been “obvious for one of ordinary skill in the art” or that it would have been “appreciated by one of ordinary skill in the art.” Clearly, the Office Action has not established a *prima facie* case of obviousness and on that basis alone, Applicants respectfully request that the rejections under 35 U.S.C. 103(a), all of which suffer from the deficiency of the rejection to claim 1, be withdrawn.¹

In addition, Applicants submit that the Office Action fails to recognize the unique and advantageous series of steps defined by the claims of the present invention. It appears that the claims of the present invention were merely used as a roadmap in an impermissible hindsight manner to attempt to cobble together various portions of Bevan, supplemented by allegedly obvious additional steps that are neither disclosed nor taught anywhere in the reference. For example, the Office Action admits that Bevan does not disclose the claimed step of demultiplexing of the coded and interleaved signal, but appears to contend that this step would be obvious from the disclosure of Bevan at column 11 lines 40 to 65 and Fig.

¹ Applicants point out that all of the obviousness rejections of the independent claims suffer from the same failure to establish a *prima facie* case of obviousness. In particular, the Office Action states on Page 5 that “claim 8 is rejected on the same ground as for claim 1,” and on Page 6 that “Claims 5 and 10 are rejected . . . as applied to claim 1 . . .” and that the “rejection of claim 1 also applies here.” Thus, all of the obviousness rejections should be withdrawn for the failure to establish a *prima facie* case of obviousness.

5(iii). However, that portion of Bevan discloses (1) a trellis coding, (2) a modulation process of the QPSK type, and (3) a demultiplexing to a plurality of transmitting antennas. Thus, the Bevan technique is a method for embodying an STTC using a convolutive binary code. The coded bits, after being rearranged, are directly modulated to a given number of symbols, which are then demultiplexed to the same number of antennae. However, the important advantages of the present invention are not realized because the Bevan technique does not disclose, teach or suggest the unique set of steps of the present claimed invention.

In particular, using claim 1 as an example, the advantages of the present invention are realized through the unique sequence of steps of (1) outer coding by means of a first code to generate a coded digital stream, (2) blockwise interleaving to generate a coded and interleaved digital stream, (3) demultiplexing into a given number of elementary interleaved coded digital streams, (4) inner coding by means of a second code to generate a set of elementary digital stream, coded by spatio-temporal combinations, and (5) transmitting the coded stream through a plurality of transmitting antennas. Such a unique sequence of steps is simply not found in Bevan or the other prior art references. The present invention realizes significant advantages over the prior art because it provides a high rate STTC coding by spatially multiplexing several STTC codings, according to the unique process defined by the steps of the claims. This process provides a good balance between diversity introduction because of the multiplicity of STTC codings and spatial multiplexing. The invention also allows to concatenate the STTC coding multiple structure with an interleaved convolutive binary code, so as to take advantage of the spatial diversity which takes place among the several STTC codings.

One of the several advantages of the approach of the present invention is a significant reduction of the Bit Error Rate with the number of reception antennae being rendered fully independent of the number of transmission antennae. Because of the independency of the number of transmitting and receiving antennae, the method of coding and decoding of the present invention is particularly well-suited for the to be implemented as a radiofrequency interface in which the complexity of the constituent receiver of such an interface is reduced, and the computational complexity of the receiver may also be reduced. Moreover, the invention may also be advantageously implemented in a mobile telephone network where the mobile unit, which may actually have relatively reduced computer processing capability, can

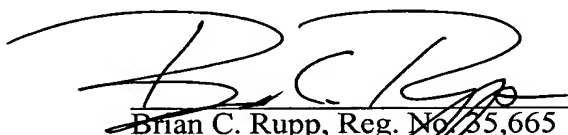
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implement the operation of decoding. The number of receiving antennae may be significantly reduced with respect to a given number of transmitting antennae of the base stations.

Accordingly, since the Office Action did not establish a *prima facie* case of obviousness, and since the unique combination of steps recited by the claimed invention are neither taught, suggested nor disclosed in the prior art, Applicants respectfully submit that the rejections under 35 U.S.C. § 103(a) be withdrawn.

Based upon the foregoing amendments and arguments, applicant respectfully requests the examiner to reconsider the application and withdraw the rejections. The application is considered in good and proper form for allowance, and the Examiner is respectfully requested to pass this application to issue. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

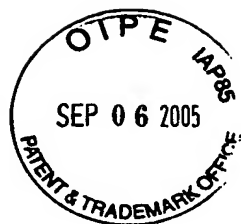
Respectfully submitted,



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CERTIFICATE OF MAILING

I hereby certify that this RESPONSE TO OFFICE ACTION OF JUNE 1, 2005 (along with any documents referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Date: September 1, 2005 I. Mikitiouk
Irina L. Mikitiouk

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